Document Control No. 4400-86-AHKV

Revision 1

FIVE-YEAR REVIEW
FINAL REPORT

FLOWOOD SUPERFUND SITE
FLOWOOD, RANKIN COUNTY, MISSISSIPPI

Work Assignment No. 86-4FE88

MARCH 1998

REGION IV

U.S. EPA CONTRACT NO. 68-W9-0057

Roy F. Weston, Inc.
Suite 200
5405 Metric Place
Norcross, Georgia 30092

WESTON W.O. No. 04400-086-097-0008-00

FIVE-YEAR REVIEW
FINAL REPORT

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MARCH 1998

Prepared by: _____ Date: 3/30/98
Ralph P. McKeen, P.E.
WESTON Work Assignment Manager

Approved by: _____ Date: 3-30-98
William R. Doyle
WESTON Region IV Program Manager

Approved by: _____ Date: _____
John McKeown
U.S. EPA Remedial Project Manager

Approved by: _____ Date: _____
Robert P. Stern
U.S. EPA Regional Project Officer

WESTON W.O. No. 04400-086-097-0008-00

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SECTION 1
BACKGROUND

1.1 INTRODUCTION

The Flowood Superfund site (Flowood) was placed on the National Priorities List in September 1984 following an initial discovery by the Mississippi Department of Environmental Quality (MDEQ) and subsequent site investigations by the U.S. Environmental Protection Agency (EPA). The investigations revealed lead contamination as a result of wastewater discharges from two industrial manufacturing facilities. Following a Feasibility Study performed by Marmon Group, Inc., under an Administrative Order by Consent, EPA issued a Record of Decision on September 30, 1988, to perform remedial actions. These actions commenced in June 1992 and concluded in August 1993. A description of the remedial actions is presented in Section 1.4 of this report.

Consistent with the Comprehensive Environmental Response, Compensation., and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Section 121(c), Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), a statutory five-year review of the remedial actions is required for this site. EPA Region IV determined that a Level I analysis is appropriate for the Flowood site.

This report presents the information collected during the review by WESTON for the U.S. EPA Region IV under the Alternate Remedial Contract Strategy (ARCS) contract. The review was intended to confirm that the remedial actions and associated performance standards in the ROD

have been achieved and that the current conditions remain protective of human health and the environment.

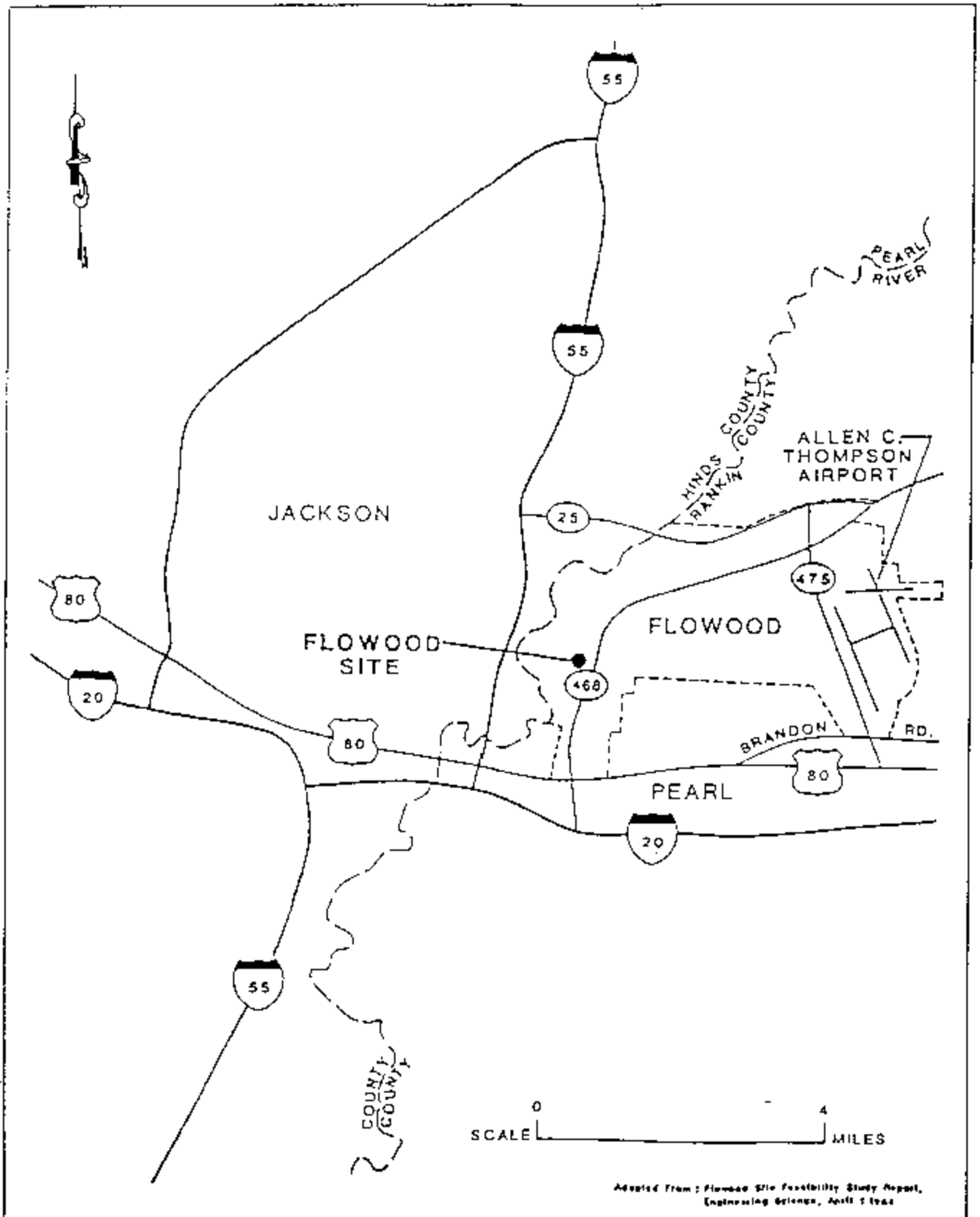
1.2 SITE LOCATION AND DESCRIPTION

The Flowood site is located in central Mississippi, east of Jackson, in the City of Flowood, Rankin County, Mississippi (Figure 1-1). The site encompasses approximately 225 acres and consists mainly of marshy lands of the alluvial plain of the Pearl River (Figure 1-2). Land use in the vicinity of the Flowood site is industrial, consisting of corrugated box and stoneware manufacturing. Industrial wastewater discharges from manufacturing were revealed as the source of contamination found at the site.

The two main manufacturing facilities at the Flowood site are Stone Container Corporation (formerly Continental Forest Company) and Rival Manufacturing Company (formerly The Marmon Group).

1.3 SITE HISTORY

In 1982 the Mississippi Department of Natural Resources Industrial Wastewater Section (now the Mississippi Department of Environmental Quality, MDEQ) discovered the presence of hazardous substances during a routine inspection. MDEQ issued an emergency permit for treatment and removal of contaminated water and sediment from the nearby canal in November 1982. MDEQ discontinued this effort when higher levels of lead were detected in the canal near the Rival Manufacturing Company facility.



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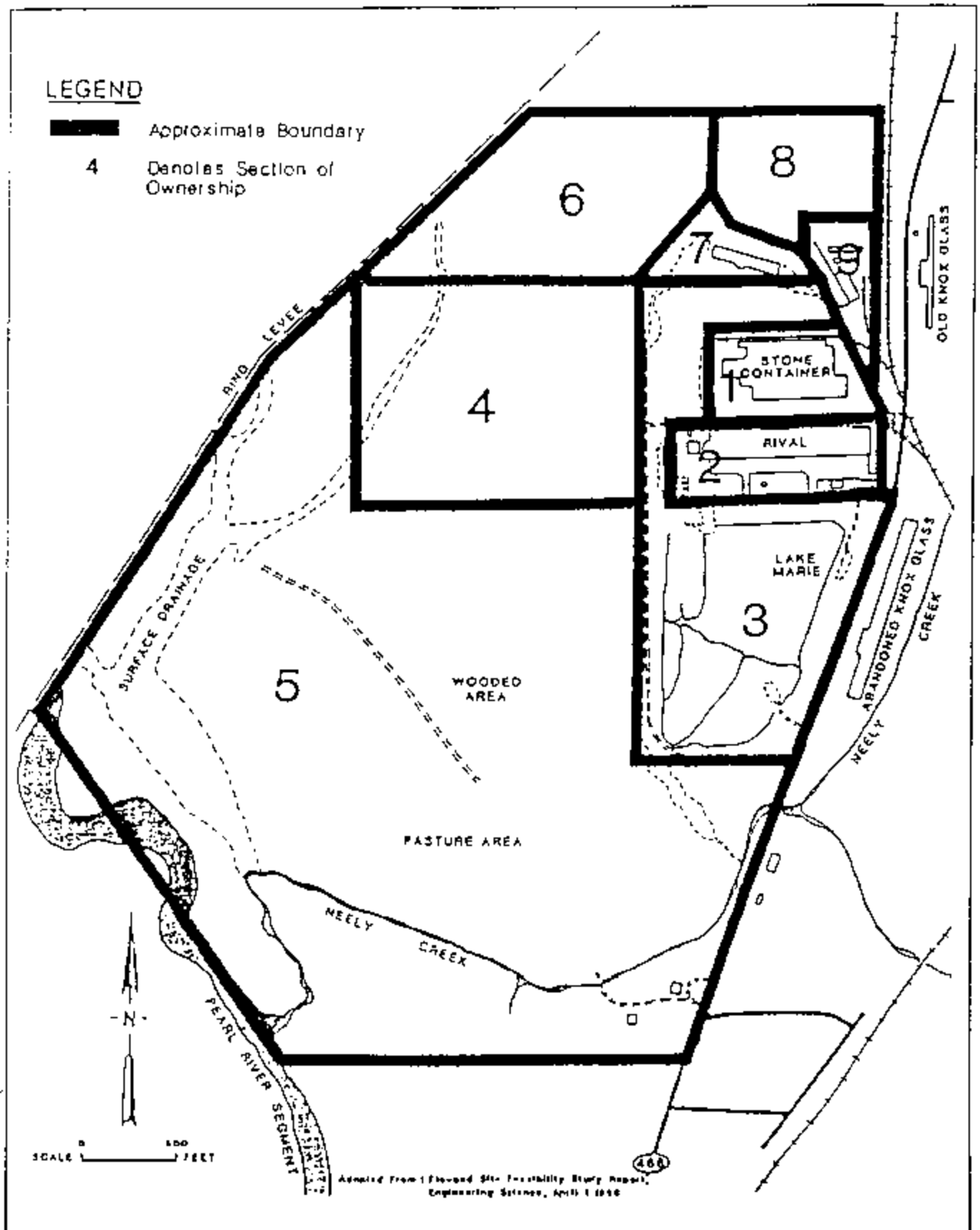
SITE LOCATION MAP

FIGURE 1-1

FLOWOOD 5-YEAR REVIEW
FLOWOOD, RANKIN CO. MISSISSIPPI



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SITE LAYOUT
FIGURE 1-2

FLOWOOD 5-YEAR REVIEW
FLOWOOD, RANKIN CO. MISSISSIPPI

The U.S. Environmental Protection Agency (EPA) was notified by MDEQ in January 1983 prompting a site investigation by NUS Corporation as a contractor to EPA. This investigation revealed lead contamination levels as high as 94,231 mg/kg in sludges around the site. EPA then evaluated the site using the CERCLA Hazard Ranking System and subsequently placed it on the National Priorities List in September 1984.

The Marmon Group (one of the PRPs) entered into a Consent Agreement with EPA on January 3, 1986, to perform the RI and FS. The final RI report was issued in August 1987 and the draft FS was released for public comment in May 1988. EPA then issued the ROD for the remedial action on September 30, 1988.

A Consent Decree was then filed on February 9, 1990, for remedial action activities at the site. The settling parties in this agreement included The Marmon Group, Rival Manufacturing Company, United Gas Pipeline Company, and KIEWIT Continental, Inc.

The Remedial Design Report and Remedial Action Work Plan were approved by EPA on August 9, 1991, and January 15, 1992, respectively. Remedial action commenced in June 1992 and was completed in April 1993 with the Final Inspection performed on August 19, 1993.

1.4 DESCRIPTION OF THE REMEDIAL ACTIONS

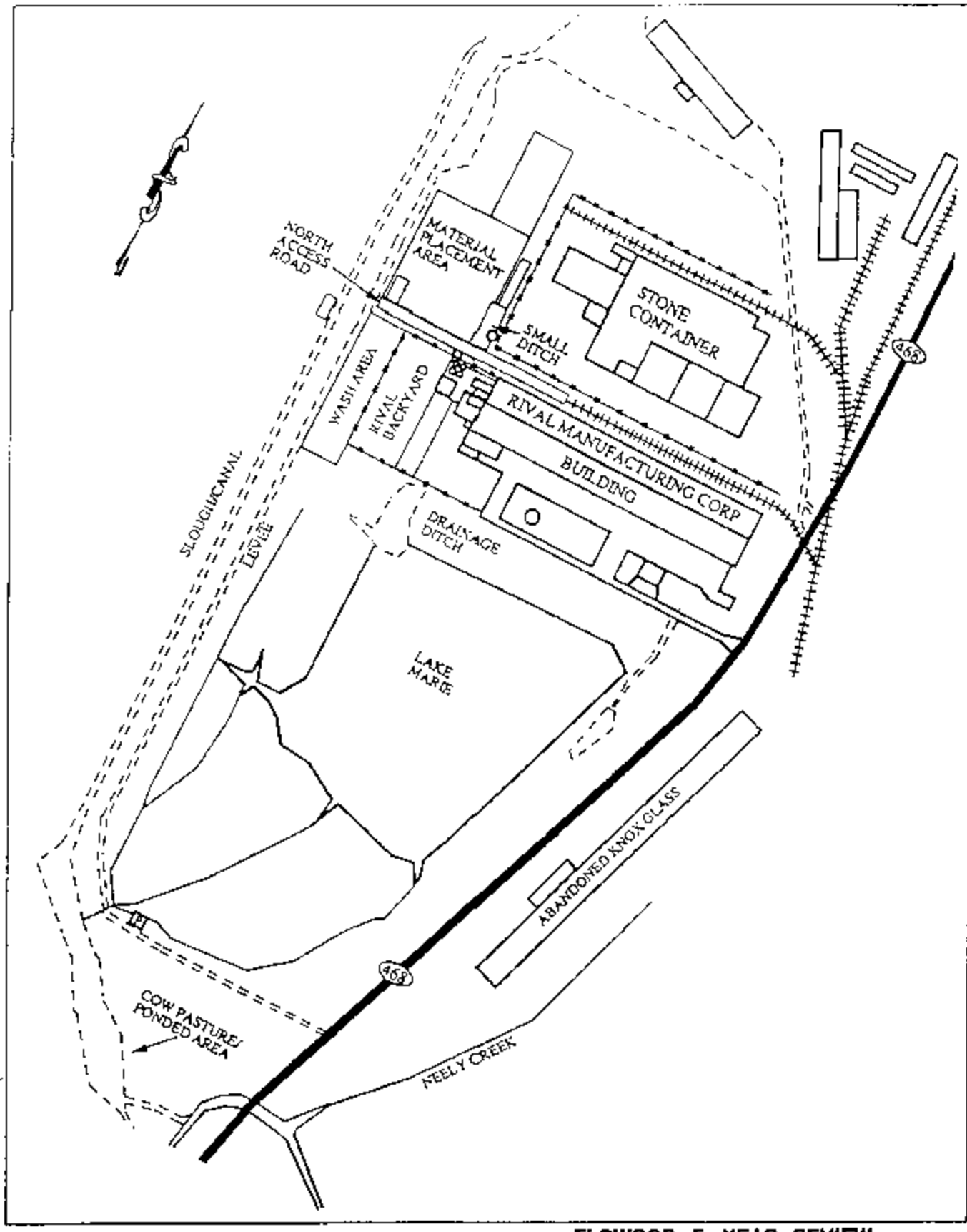
The selected remedial actions at the Flowood site as presented in the ROD included excavation of contaminated soil and sediments followed by on-site solidification/stabilization. No remediation of groundwater was deemed necessary and only quarterly monitoring for the first year was recommended with frequencies evaluated by EPA thereafter.

Remedial actions were performed in two phases. Phase I included the small ditch, the slough canal, the Rival backyard, the North Access Road, the cow pasture, and tracts within the material placement area (MPA). Phase II remedial action included Lake Marie, the drainage ditch leading to Lake Marie, the wash area, and closure of the MPA (see Figure 1-3 for location of these areas).

Heritage Remediation/Engineering, Inc., of Indianapolis, Indiana, was the firm selected for the remedial action construction. The PRPs selected Patterson Associates, Inc., as the Remedial Action Coordinator and Consoer, Townsend & Associates as the Resident Engineer.

The initial step of the remedial action involved the preparation of a material processing area for the solidification/stabilization (S/S) process. The wash area as shown on Figure 1-3 was prepared by excavating contaminated material within this area and backfilling with clean fill and covering with a high-density polyethylene liner.

The S/S process was accomplished by excavating contaminated soils and sediments and placing them into a power screen to remove large debris and till the soil to pass a two-inch diameter screen. After the screening process, a conveyor fed the soil into a pug mill that mixed the soil with a proprietary ingredient (PNSI), fly ash, kiln dust, and water at the necessary proportions as determined in the remedial design. This process worked well for the sandy loam soils but had to be modified when clayey soils were encountered in the slough canal. The S/S process was then modified to premix the contaminated material with Portland cement in a pit using an excavator followed by processing in the pug mill with additional Portland cement. No other stabilization agents were used due to its incompatibility with the Portland cement. The final blended material exited the pug mill on a conveyor to a treated material stockpile. When the S/S material cured, it was sampled and analyzed for lead using the Extraction Procedure (EP) Toxicity test. The ROD



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REMEDIATION AREAS

FIGURE 1-3

FLOWOOD 5-YEAR REVIEW
FLOWOOD, RANKIN CO. MISSISSIPPI

maximum EP Toxicity level was 5 mg/L lead. If this level was achieved, the material was moved to the MPA.

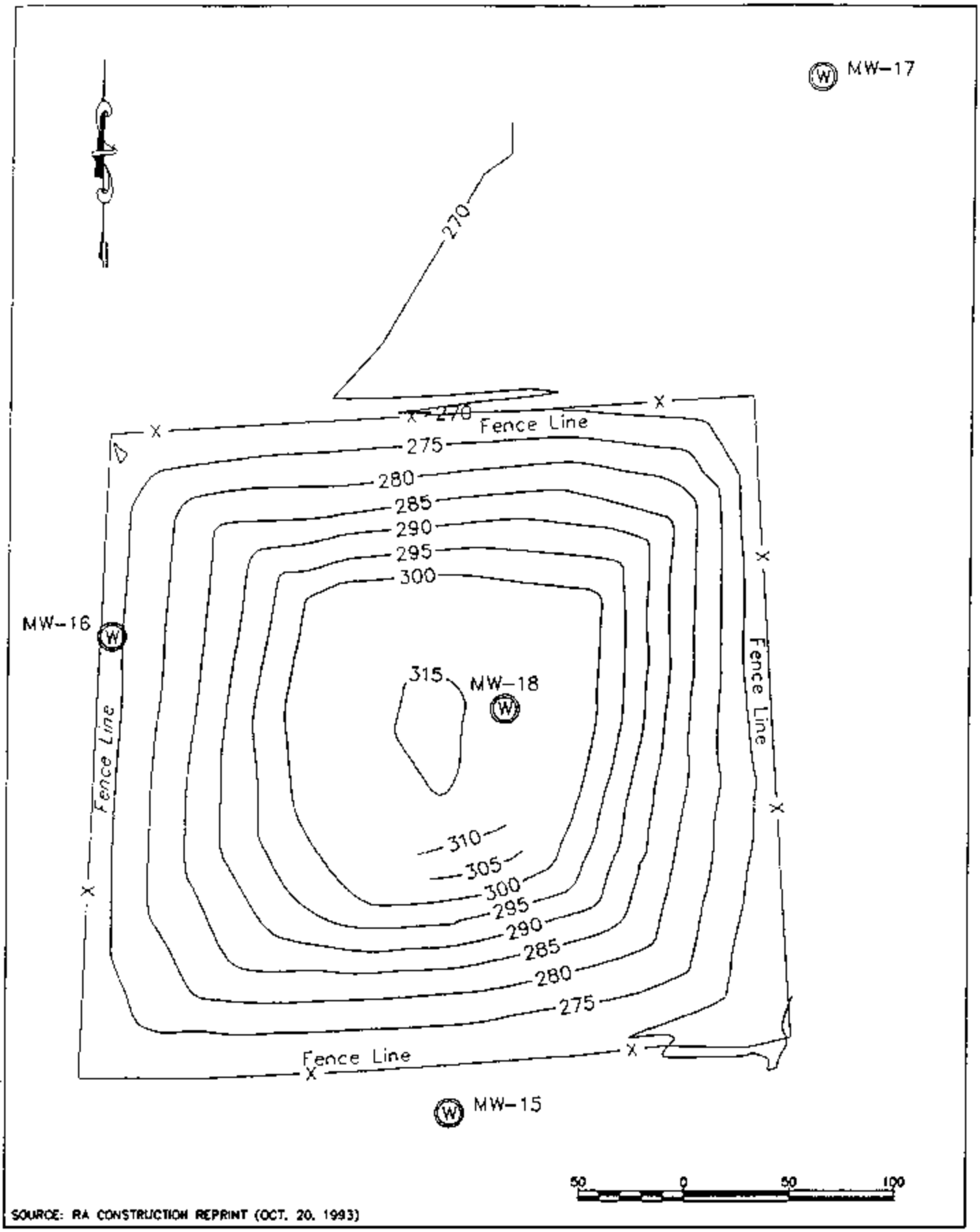
The MPA was initially excavated 4 to 5 feet below surrounding grade to elevation 265 msl. A one-foot thick layer of sand was spread over the MPA floor prior to placing S/S material. The final MPA footprint area is approximately 2.2 acres with final grades as shown on the record drawing (Figure 1-4). The treated material within the MPA was covered with one foot of clay and six inches of topsoil. A total of approximately 47,000 cubic yards of treated material was placed into the MPA. The S/S process materials (including the Portland cement, fly ash, kiln dust, and PNSI) accounted for approximately 15% of the total volume of material placed in the MPA. Verification samples were collected from all excavation areas to confirm that the ROD cleanup objective of 500 mg/kg was met at the excavation limits.

1.5 ARARS REVIEW

Section 121 (d) (2) (A) of CERCLA incorporates into the law the CERCLA Compliance Policy, which specifies that Superfund remedial actions must meet any federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). Also included is the provision that State ARARs must be met if they are more stringent than federal requirements.

The ARARs identified and considered in the Feasibility Study and ROD for this remedial action included:

- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA);
- Superfund Amendment and Reauthorization Act (SARA);
- Resources Conservation and Recovery Act (RCRA);



SOURCE: RA CONSTRUCTION REPRINT (OCT. 20, 1993)

MPA RECORD DRAWING

FIGURE 1-4

FLOWOOD 5-YEAR REVIEW
FLOWOOD, RANKIN CO. MISSISSIPPI

- Flood Plan Management Executive Order 11988;
- Safe Drinking Water Act;
- Clean Water Act,
- Endangered Species Act.

WESTON reviewed these ARARs with respect to change in the standards as well as any new standards promulgated since the remedial action.

The Extraction Procedure (EP) lead value of 5 mg/L was used for the treatment level of the solidified waste. New Toxicity Characteristic revisions were developed in 1990 which changed the required test from the EP test to the Toxicity Characteristic Leaching Procedure (TCLP) test. For lead, the regulatory level remained at 5 mg/L for the extract. The difference is the method used to leach metals from the waste. This is waste specific for both test procedures, so it is not possible to determine which would be more stringent for this site. Since the solidified material is in place, the ultimate test for adequate protection is monitoring the lead levels in the surrounding groundwater monitoring wells. Based on the results of sampling conducted during this five-year review, the solidified material appears to be stable and not leaching lead contamination greater than 5 mg/L.

The ROD set a protective Maximum Contaminant Level (MCL) for lead based on non-carcinogenic effects at 50 μg/L. The current EPA drinking water standard for lead is 15 μg/L, which is an "action level" at the tap. There is no MCL for lead. The analytical detection limit for lead during the most recent sampling event was 5 μg/L.

SECTION 2
SITE CONDITIONS

2.1 SUMMARY OF SITE INSPECTION

WESTON representative Ralph P. McKeen performed a site inspection on November 19, 1997. Also on site during this visit were Mr. Michael Slack (MDEQ), Don Nichols (PRP Attorney), and a sampling team from Hazclean Corporation. The inspection consisted of a walk-through of the entire site, locating existing wells and other facility features. The purpose of this visit was to observe the current site conditions and evaluate the effectiveness of the remedial actions. Mr. Slack was on site to split groundwater samples being collected by Hazclean.

The following is a summary of WESTON's observations made during the site tour with references to photographs which are included as Appendix A of this report. The site is in an industrial area which consists mainly of the Material Placement Area (MPA) (Photograph No. 1). The MPA is adjacent to the Rival Manufacturing facility, Stone Container plant, and a bituminous concrete plant (Photographs 2 and 3).

As seen in Photograph No. 2, a security chain link fence surrounds the MPA. Silt fence fabric which is attached at the bottom of the fence to control any erosion of the soil cover on the MPA.

During the site visit, the PRP contractor, Hazclean, collected groundwater samples from the monitoring wells. Mr. Michael Slack, MDEQ, collected a split sample for independent analysis (Photograph No 4). Only 3 of the 4 monitoring wells could be sampled, MW-15, MW-16, and MW-17. MW-18, which is located near the center of the MPA (Photograph No. 7), penetrates

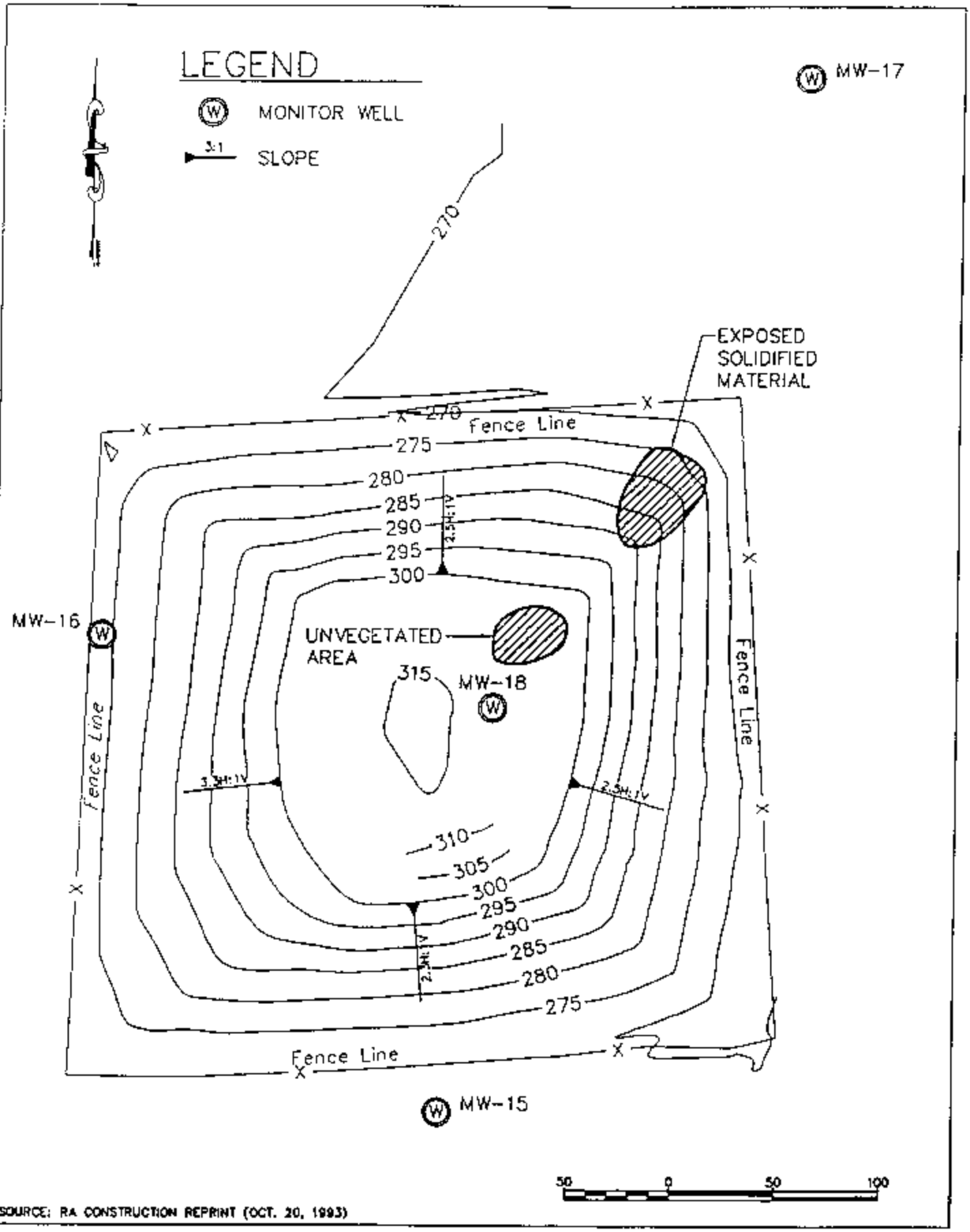
through the solidified waste and extends to the bottom of the MPA. No fluids were present in the well bore for sampling. Analytical results of the groundwater samples are provided in Appendix B.

WESTON's McKeen continued an inspection of the cover system on the MPA. A good stand of vegetation has been established. There were two small sections that were eroded with no vegetation. The first section is on the northeast slope and the second is located on the top surface of the MPA. See Figure 2-1 for locations of these bare areas. The section on the northeast corner is approximately 50 feet by 30 feet (Photograph No. 10). The soil cover had eroded completely in this area down to the solidified matrix of the MPA (Photograph No. 11). The cover system design of the MPA is to include a 1-foot thick layer of clay followed by 6 inches of topsoil capable of sustaining vegetation. The cover system is intended to protect the treated material from eroding.

The top unvegetated section is approximately 20 feet in diameter and located near MW-18 (Photograph No. 12). Due to the relatively mild slope on the top section, there did not appear to be any signs of soil cover erosion.

WESTON's McKeen continued the inspection by visually observing the surrounding areas from on top of the MPA. The remediated areas including the slough/canal and Lake Marie have grown back with vegetation (Photograph No. 9). Mr. Nichols informed WESTON that Lake Marie has since been backfilled with additional fill material and no longer holds water.

Both Stone Container and the Rival Manufacturing facilities are active and appear to be unaffected by the remedial actions. The west section of the Rival facility which contains contaminated soil under production silos remains active. Deed restrictions have been placed on



SOURCE: RA CONSTRUCTION REPRINT (OCT. 20, 1993)

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MPA INSPECTION DRAWING

FIGURE 2-1

FLOWOOD 5-YEAR REVIEW
FLOWOOD, RANKIN CO. MISSISSIPPI

this property to prevent future construction or development that would disturb the subsurface contamination.

2.2 SUMMARY OF INTERVIEWS

The Five-Year Review process requires that key individuals involved with the site be contacted for interviews. The interview process is intended to ascertain any new applicable information regarding the selected remedy, site history, and other site-specific issues. During the site inspection, WESTON solicited input from Mr. Michael Slack and Mr. Don Nichols. All other interviews were conducted by telephone.

WESTON interviewed Mr. Don Nichols while he was on site to observe the sampling and inspection activities. Mr. Nichols is an attorney from the firm of Wise, Carter, Child & Caraway in Jackson, Mississippi, that represents Rival Manufacturing. Mr. Nichols stated that he has been involved with the site since the initial investigation by MDEQ. He said that there were four PRPs initially identified and that Rival and the Marmon Group remained active participants throughout the remedial action. The other two PRPs, United Gas Pipeline and Continental Forest (Stone Container), "cashed out" prior to signing of the Consent Decree.

Mr. Nichols said that overall the project went well, particularly since the project evolved into a much larger and more complicated project due to the contamination found in Lake Marie. The contaminated sediments discovered in Lake Marie not only created additional volume but also required a dewatering operation for effective sediment removal.

Mr. Nichols also mentioned that he has been very pleased with the work conducted by Singley Construction Company, Inc., to maintain and rework the slopes of the MPA. Singley is currently

the firm that performs the erosion monitoring and also performs the grass mowing, reseeding, and fertilization as necessary. A stockpile of topsoil and hay bales had been staged adjacent to the MPA by Singley to make repairs to the bare soil areas noted during the site inspection.

WESTON's McKeen questioned Mr. Nichols about public involvement as well as any local government concerns. Mr. Nichols stated that there has been no public involvement since issues have remained within the industrial park area and the residential areas were not impacted.

Mr. Michael Slack of the MDEQ was also available to interview during the site inspection visit. He has been involved with the site since 1989, approximately one year after the signing of the ROD. Mr. Slack expressed that the remedial effort went very well despite complications during construction. He felt that the PRPs were very cooperative and that their consultants and contractors were very competent. Mr. Slack voiced a concern that the slopes of the MPA were very steep; however, this was unavoidable due to the limited footprint space.

WESTON's McKeen inquired about the groundwater monitoring program outside the 4 wells being sampled during the inspection. Mr. Slack explained that all of the deep monitoring wells installed for the remedial investigation had been abandoned. Based on the results of the RI, it was concluded that the deep aquifer was unaffected by contamination at the site due to a fat clay confining layer several hundred feet thick that prevents any vertical migration.

Mr. Neal Lewis of the U.S. Army Corps of Engineers in Vicksburg, Mississippi, was contacted via telephone. Mr. Lewis was the construction oversight representative for the U.S. EPA. Mr. Lewis commented that the remedial action went well. He said that although numerous consulting firms and construction companies were involved, the project was completed with a great deal of consistency. Mr. Neal expressed that the major challenge of the RA was finding the proper mix of

stabilization material and contaminated soil in order for the final blend to meet the EP toxicity level.

WESTON contacted Mr. James Patterson of Patterson Associates Inc. (PAI), an independent environmental consultant that functioned as the Remedial Action Coordinator (RAC) during the remedial construction. Mr. Patterson felt that the construction activities went very well. He echoed similar remarks by previous interviewees regarding the size of the project which expanded considerably, causing the MPA to be much larger than anticipated. Mr. Patterson was very complimentary of all the agencies and PRPs involved, noting very good communication that enhanced his coordination efforts. Overall, he was very pleased with the cooperation considering the multi-party involvement, both from the regulatory side as well as the PRP side.

2.3 AREAS OF NON-COMPLIANCE

Two bare soil areas were noted on the MPA. One of these areas had eroded down to the solidified material leaving it exposed to potential erosion. According to Mr. Nichols, plans have been made to correct these eroded areas, as evidenced by the soil stockpile and hay bales staged adjacent to the MPA.

SECTION 3

RECOMMENDATIONS

3.1 TECHNOLOGY RECOMMENDATIONS

The bare soil areas require the addition of more cover soil followed by reseeding to establish permanent vegetation for erosion protection of the stabilized material. Consultation with the local National Resource Conservation Service of the U.S. Department of Agriculture is recommended to obtain the proper application rates and fertilization requirements best suited for the local conditions.

The approximate 2.5 H: 1V side slopes in some areas are very steep, making it difficult to maintain vegetation. Permanent erosion control matting material is recommended in these critical slope areas to provide reinforcement to the vegetative root system.

3.2 ADMINISTRATIVE RECOMMENDATIONS

Based on the five-year review activities, it is apparent that the routine erosion inspection activities required in the EPA-approved O&M Plans are performed regularly. The reports, however, cannot fully depict the current condition. It is recommended that an MDEQ representative continue periodic visits (twice yearly) to inspect the MPA cover conditions.

3.3 REQUIREMENTS FOR RECOMMENDATION IMPLEMENTATION

The MDEQ should submit a brief summary of their inspection visits to EPA in addition to the monthly status reports submitted by the PRP.

3.4 STATEMENT ON PROTECTIVENESS

The remediated areas, specifically the canal and Lake Marie, appear to be thriving with new vegetation. The MPA is well protected by a locked security fence. Deed restrictions on the MPA and west portion of the Rival plant to prevent drilling or construction activities in the area must remain in place.

The capping portion of the remedy continues to eliminate the surface water and direct exposure threat to any of the buried solidified waste constituents. The cover system is well maintained with the exception of some minor erosion. No detectable levels of lead were found in the three surrounding monitoring wells indicating that the solidified material is stable. Overall, the site continues to provide protection from contaminants as originally intended.

3.5 NEXT REVIEW

During the next review, WESTON suggests a similar format and level of effort. Groundwater sampling should also be performed whether it is being performed as an O&M activity or part of the Five-Year Review process.

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

APPENDIX B

GROUNDWATER SAMPLING RESULTS

STATE OF MISSISSIPPI
DEPARTMENT OF ENVIRONMENTAL QUALITY
JAMES I. PALMER, JR.
EXECUTIVE DIRECTOR

December 23, 1997

Ralph McKean
Weston
5405 Metric Place
Suite 200
Norcross GA 30093

Re: Flowood NPL Site
Flowood, MS

Dear Mr. McKean:

Please find enclosed the analytical results of the split groundwater samples collected by the Mississippi Department of Environmental Quality (MDEQ) on November 19, 1997, at the above referenced site. If you have any questions or comments please feel free to call me at (601) 961-5217.

Sincerely,

Michael T. Slack, P.E.

MTS: Flo_end

MISSISSIPPI DEPARTMENT
OF ENVIRONMENTAL QUALITY

CHAIN OF CUSTODY RECORD

OFFICE OF
POLLUTION CONTROL
P. O. Box 10385
Jackson, Mississippi 39289-0385

MSD: 980710941

PROJECT LEADER: Michael Slack - MDEQ

PROJECT NAME/LOCATION: Flowood NPL Site

REMARKS: HazClean Reps split samples with MDEQ Rep Michael Slack

DATA TO: Michael Slack - Uncontrolled Sites Section

ESD SAMPLE TYPES
1. SURFACE WATER
2. GROUND WATER
3. POTABLE WATER
4. WASTEWATER
5. LEACHATE
6. SOIL/SEDIMENT
7. SLUDGE
8. WASTE
9. AIR
10. FISH
11. OTHER

SAMPLER: HazClean Reps split samples with MDEQ Rep Michael Slack

STATION NO.	SAMPLE TYPE	DATE (1997)	TIME	COMP	GRAB	STATION LOCATION/DESCRIPTION	TOTAL CONTAINERS	ANALYSIS: CIRCLE/ADD parameters desired. List no. of containers submitted. (VOA / Semi volatiles & org. gases / Pest/PCBs / METALS / CYANIDE / LEAD)	TAG NO./REMARKS	Custody Seals Intact at Lab	Seals Not Intact Upon Receipt by Lab	LAB USE ONLY
MW-17	2	11/19	12:00		✓	North of MPA - BACKGROUND	1	LEAD ✓	Drinking water standards			2885
MW-15	2	11/19	12:30		✓	South of MPA - DOWNGRADIENT	1	LEAD ✓	Drinking water standards			2886
MW-16	2	11/19	12:50		✓	West of MPA - SIDEGRADIENT	1	LEAD ✓	Drinking Water Standards			2887

RELINQUISHED BY: (PRINT)	(SIGN)	DATE/TIME	RECEIVED BY: (PRINT)	(SIGN)	RELINQUISHED BY: (PRINT)	(SIGN)	DATE/TIME	RECEIVED BY: (PRINT)	(SIGN)
Michael T. Slack	MDEQ	11/19/97 1:20PM	V. Stamps						
RELINQUISHED BY: (PRINT)	(SIGN)	DATE/TIME	RECEIVED BY: (PRINT)	(SIGN)	RELINQUISHED BY: (PRINT)	(SIGN)	DATE/TIME	RECEIVED BY: (PRINT)	(SIGN)

DISTRIBUTION: White and Yellow copies accompany sample shipment to laboratory; Yellow copy retained by laboratory. White copy is returned to samplers; Pink copy retained by samplers.

8/90

BUREAU OF POLLUTION CONTROL
SAMPLE REQUEST FORM

Lab Bench No.: 2885
Cost Code: 3352

I. GENERAL INFORMATION:

Facility Name: Flowood NPL Site, Flowood, MS
County Code: **NPDES Permit No.:**
Discharge No: **Date Requested: 11/19/97**
Sample Point Identification: MW- 17 North of MPA
Requested By: Michael Slack **Data To: Michael Slack**
Type of Sample: Grab: X Composite: Flow: Time: Other:

II. SAMPLE IDENTIFICATION:

Environment Condition: Sunny 55°F **Collected By: M. Slack**
Where Taken: Monitoring Well - 17 (MW-17)

	Type	Parameters	Preservative	Date	Time
1.	GW	Lead	HNO_3	11/19/97	1200
2.					
3.					
4.					
5.					

III. FIELD

Analysis	Computer Req Code		Results	Analyst	Date
pH	000400				
D.O.	000300				
Temperature	000010				
Residual Chlorine	050060				
Flow	074060				

IV. TRANSPORTATION OF SAMPLE:

Bus: **RO Vehicle:** **Other:**

V. LABORATORY:

Received by: V. Stamps **Date: 11/19/97 Time: 1320**
Recorded by: Dot Lewis **Date Sent to State Office:** 12/16/97

VI. Remarks:

I. GENERAL INFORMATION: Facility Name Flowood NPL Site, Flowood MS
County Code _____ NPDES Permit No. _____
Discharge No. _____ Date Requested 11/19/97
Sample Point Identification MW-17 North of MPA
Requested By Michael Slack (MDEQ) Data To Same
Type of Sample: Grab (✓) Composite (Flow) (Time) Other ( )

II. SAMPLE IDENTIFICATION:
Environment Condition Sunny - 55°F Collected By M. Slack
Where Taken Monitoring Well-17 (MW-17)

	Type	Parameters	Preservative	Date	Time
1.	GW	LEAD	HNO3	11/19	12:00pm
2.					
3.					
4.					
5.					

III. FIELD:

Analysis	Computer Code	Request	Results	Analyst	Date
pH	(000400)	( )			
D.O.	(000300)	( )			
Temperature	(000010)	( )			
Residual Chlorine	(050060)	( )			
Flow	(074060)	( )			

IV. TRANSPORTATION OF SAMPLE: Bus BO Vehicle ( ) Other ( )
V. LABORATORY: Received By _____ Date 11/19/97 Time 1320
Recorded By _____ Date Sent to State Office _____

Analysis	Computer Code	Request	Result	Analyst	Date Measured
BOD_5	(000310)	( )	mg/l		*
COD	(000340)	( )	mg/l		
TOC	(000680)	( )	mg/l		
Suspended Solids	(099000)	( )	mg/l		
TKN	(000625)	( )	mg/l		
Ammonia-N	(000610)	( )	mg/l		
Fecal Coliform(1)	(074055)	( )	colonies/100 ml		*
Fecal Coliform(2)	(074055)	( )	colonies/100 ml		*
Total Phosphorus	(000665)	( )	mg/l		
Oil and Grease(1)	(000550)	( )	mg/l		
Oil and Grease(2)	(000550)	( )	mg/l		
Chlorides	(099016)	( )	mg/l		
Phenol	(032730)	( )	mg/l		
Total Chromium	(001034)	( )	mg/l		
Hex. Chromium	(001032)	( )	mg/l		
Zinc	(001092)	( )	mg/l		
Copper	(001042)	( )	mg/l		
Lead - DRINKING WATER STANDARDS	(017501)	(✓)	mg/l		
Cyanide	(000722)	( )	mg/l		
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			

Remarks _____

*Date of Test Initiation

1352 - Flowood NPL Site

2885

++++

INORGANICS REPORT
WATER

SAMPLE No.: 2885

ANALYSES: DATE COLLECTED:

PARAMETER	CONC. ug/l	MQL ug/l	QC % Rec.	Analyst	Date
Lead	ND	5.0	114	JC	12/1/97

MQL = minimum quantifiable levels
QC %Rec = percent recovery of quality control standard

BUREAU OF POLLUTION CONTROL
SAMPLE REQUEST FORM

Lab Bench No.: 2887
Cost Code: 3352

I. GENERAL INFORMATION:

Facility Name: Flowood NPL Site, Flowood, MS
County Code: **NPDES Permit No.:**
Discharge No: **Date Requested: 11/19/97**
Sample Point Identification: MW - 16 (Monitoring well #16)
Requested By: **Data To:**
Type of Sample: Grab: X Composite: Flow: Time: Other:

II SAMPLE IDENTIFICATION:

Environment Condition: Sunny 55°F **Collected By: M.Slack**
Where Taken: MW-16

	Type	Parameters	Preservative	Date	Time
1.	GW	Lead	HNO_3	11/19/97	1250
2.					
3.					
4.					
5.					

III. FIELD

Analysis	Computer Req Code		Results	Analyst	Date
pH	000400				
D.O.	000300				
Temperature	000010				
Residual Chlorine	050060				
Flow	074060				

IV. TRANSPORTATION OF SAMPLE:

Bus: **RO Vehicle:** **Other:**

V. LABORATORY:

Received by: V. Stamps **Date: 11/19/97** **Time: 1320**
Recorded by: Dot Lewis **Date Sent to State Office:** 12/16/97

VI. Remarks:

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INORGANICS REPORT
WATER

SAMPLE No: 2287

ANALYSES:

DATE COLLECTED:

PARAMETER	CONC. ug/l	MQL ug/l	QC % Rec.	Analyst	Date
Lead	ND	5.0	114	JC	12/1/97

MQL = minimum quantifiable levels
QC %Rec = percent recovery of quality control standard

BUREAU OF POLLUTION CONTROL
SAMPLE REQUEST FORM

Lab Bench No. _____

GENERAL INFORMATION: Facility Name FLOWOOD NPL SITE, FLOWOOD, MS
County Code _____ NPDES Permit No. _____
Discharge No. _____ Date Requested 11/19/97
Sample Point Identification MW-16 (MONITORING WELL #16)
Requested By _____ Data To _____
Type of Sample: Grab (✓) Composite (Flow) (Time) Other ( )

II. SAMPLE IDENTIFICATION:
Environment Condition SUNNY 55°F Collected By M. SLACK (MDEQ)
Where Taken MW-16

	Type	Parameters	Preservative	Date	Time
1.	GW	LEAD	HNO_3	11/19	12:50 PM
2.					
3.					
4.					
5.					

I. FIELD:

Analysis	Computer Code	Request	Results	Analyst	Date
pH	(000400)	( )			
D.O.	(000300)	( )			
Temperature	(000010)	( )			
Residual Chlorine	(050060)	( )			
Flow	(074060)	( )			

I. TRANSPORTATION OF SAMPLE: Bus ( ) RO Vehicle ( ) Other ( )
V. LABORATORY: Received By _____ Date 11/19/97 Time 1220
Recorded By _____ Date Sent to State Office _____

Analysis	Computer Code	Request	Result	Analyst	Date Measured
BOD_5	(000310)	( )	mg/l		*
COD	(000340)	( )	mg/l		
TOC	(000680)	( )	mg/l		
Suspended Solids	(099000)	( )	mg/l		
TKN	(000625)	( )	mg/l		
Ammonia-N	(000610)	( )	mg/l		
Fecal Coliform(1)	(074055)	( )	colonies/100 ml		*
Fecal Coliform(2)	(074055)	( )	colonies/100 ml		*
Total Phosphorus	(000665)	( )	mg/l		
Oil and Grease(1)	(000550)	( )	mg/l		
Oil and Grease(2)	(000550)	( )	mg/l		
Chlorides	(099016)	( )	mg/l		
Phenol	(032730)	( )	mg/l		
Total Chromium	(001034)	( )	mg/l		
Hex. Chromium	(001032)	( )	mg/l		
Zinc	(001092)	( )	mg/l		
Copper	(001042)	( )	mg/l		
Lead (DRINKING WATER STANDARDS)	(017501)	(✓)	mg/l		
Cyanide	(000722)	( )	mg/l		
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			
		( )			

Remarks _____

*Date of Test Initiation

1352 - FLOWOOD NPL SITE

2887

BUREAU OF POLLUTION CONTROL
SAMPLE REQUEST FORM

Lab Bench No.: 2886
Cost Code: 3352

VI. GENERAL INFORMATION:

Facility Name: Flowood NPL Site, Flowood, MS
County Code: **NPDES Permit No.:**
Discharge No: **Date Requested: 11/19/97**
Sample Point Identification: MW - 15
Requested By: CMI **Data To:**
Type of Sample: Grab: X Composite: Flow: Time: Other:

II SAMPLE IDENTIFICATION:

Environment Condition: Sunny 55°F **Collected By: M.Slack**
Where Taken: MW - 16

	Type	Parameters	Preservative	Date	Time
1.	GW	Lead	HNO_3	11/19/97	1230
2.					
3.					
4.					
5.					

III. FIELD

Analysis	Computer Req Code		Results	Analyst	Date
pH	000400				
D.O.	000300				
Temperature	000010				
Residual Chlorine	050060				
Flow	074060				

IV. TRANSPORTATION OF SAMPLE:

Bus: **RO Vehicle:** **Other:**

V. LABORATORY:

Received by: V. Stamps **Date: 11/19/97 Time: 1320**
Recorded by: Dot Lewis **Date Sent to State Office:** 12/16/97

VI. Remarks:

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INORGANICS REPORT
WATER

SAMPLE No:2286

ANALYSES:

DATE COLLECTED:

PARAMETER	CONC. ug/l	MQL ug/l	QC % Rec.	Analyst	Date
Lead	ND	5.0	114	JC	12/1/97

MQL = minimum quantifiable levels
QC %Rec = percent recovery of quality control standard

BUREAU OF POLLUTION CONTROL
SAMPLE REQUEST FORM

Lab Bench No. _____

GENERAL INFORMATION: Facility Name FLOWOOD NPL SITE, FLOWOOD, MS
County Code _____ NPDES Permit No. _____
Discharge No. _____ Date Requested 11/19/97
Sample Point Identification MW-15
Requested By _____ Data To _____
Type of Sample: Grab (✓) Composite (Flow) (Time) Other ( ) _____

II. SAMPLE IDENTIFICATION:
Environment Condition SUNNY 55°F Collected By M. SLACK
Where Taken MW-15

	Type	Parameters	Preservative	Date	Time
1.	GW	LEAD	HNO_3	11/19	12:30
2.					
3.					
4.					
5.					

III. FIELD:

Analysis	Computer Code	Request	Results	Analyst	Date
pH	(000400)	( )			
D.O.	(000300)	( )			
Temperature	(000010)	( )			
Residual Chlorine	(050060)	( )			
Flow	(074060)	( )			

IV. TRANSPORTATION OF SAMPLE: BOS (✓) RO Vehicle ( ) Other ( )
V. LABORATORY: Received By _____ Date 11/19/97 Time 1320
Recorded By _____ Date Sent to State Office _____

Analysis	Computer Code	Request	Result	Analyst	Date Measured
BOD_5	(000310)	( )	mg/l		*
COD	(000340)	( )	mg/l		
TOC	(000680)	( )	mg/l		
Suspended Solids	(099000)	( )	mg/l		
TKN	(000625)	( )	mg/l		
Ammonia-N	(000610)	( )	mg/l		
Fecal Coliform(1)	(074055)	( )	colonies/100 ml		*
Fecal Coliform(2)	(074055)	( )	colonies/100 ml		*
Total Phosphorus	(000665)	( )	mg/l		
Oil and Grease(1)	(000550)	( )	mg/l		
Oil and Grease(2)	(000550)	( )	mg/l		
Chlorides	(099016)	( )	mg/l		
Phenol	(032730)	( )	mg/l		
Total Chromium	(001034)	( )	mg/l		
Hex. Chromium	(001032)	( )	mg/l		
Zinc	(001092)	( )	mg/l		
Copper	(001042)	( )	mg/l		
Lead DRINKING WATER STANDARD	(017501)	(✓)	mg/l		
Cyanide	(000722)	( )	mg/l		
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			
_____	_____	( )			

Remarks _____

*Date of Test Initiation

1352 - FLOWOOD NPL SITE

2886

ARGUS ANALYTICAL, INC.

235 Highpoint Drive
Jackson, Mississippi 39213

Telephone: 601/957-2676 FAX: 601/957-1887

To: Hazclean Env. Consultants, Inc.
P.O. Box 16485
Jackson, MS 39236-6485

ATTN: Mark Walters

Date Reported: 12/08/97

Date Received: 11/19/97

Project ID/Location: Flowood NPL Site
Flowood, MS

Project Number: 1569

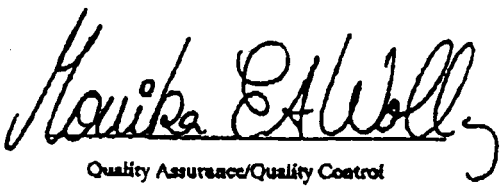
SAMPLE INFORMATION

Sample No.	Sample Description	Matrix	Date/Time Sampled		Sampled by
AA49864	MW-17	WATER	11/19/97	12:06	M. Walters
AA49865	MW-15	WATER	11/19/97	12:34	M. Walters
AA49866	MW-16	WATER	11/19/97	13:00	M. Walters
AA49867	Duplicate	WATER	11/19/97		M. Walters

ANALYTICAL RESULTS

Sample No.	Parameter	Result	Units	MDL	Method	Analysts	Date
AA49864	Lead	ND	mg/L	0.001	200.9	CLS	12/02/97
AA49865	Lead	0.001	mg/L	0.001	200.9	CLS	12/04/97
AA49866	Lead	0.001	mg/L	0.001	200.9	CLS	12/02/97
AA49867	Lead	ND	mg/L	0.001	200.9	CLS	12/02/97

ND=Not Detected

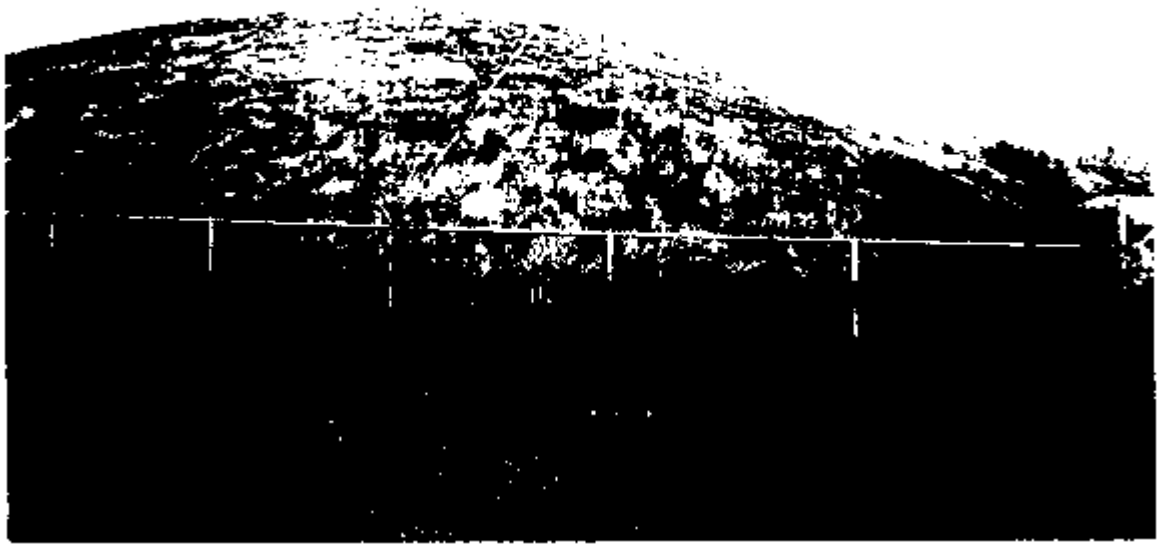


Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION



Photograph No. 1 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: Southeast corner of the Material Placement Area (MPA) as viewed from the Rival Manufacturing Facility.

Photograph No. 2 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: East side of the MPA showing chain link security fence surrounding the site and silt fence for sedimentation control.

Photograph No. 3 **Date:** November 19,1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: PRP contractor purging well MW-17 in preparation for sampling. This well is located northeast of the MPA adjacent to a bituminous concrete plant operation. Oily, dark residue from this plant was observed in the soil around the well.

Photograph No. 4 **Date:** November 19, 1997
Location: Flowood NPL Site Five- Year Review, Flowood, Mississippi
Description: PRP contractor collecting water sample from well MW- 16 and splitting the sample with Michael Slack of the Mississippi Department of Environmental Quality.

Photograph No. 5 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: South side of the MPA showing the security fence and access gate which was opened for the five-year review and sampling activities.

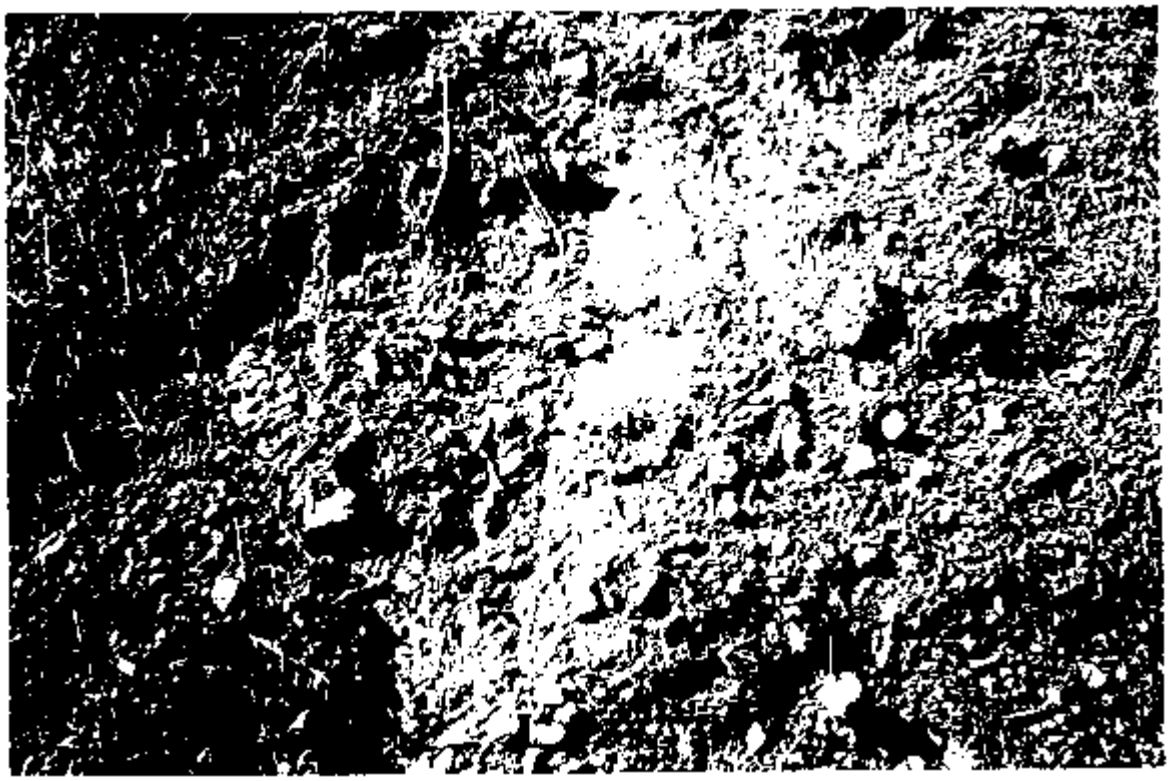
Photograph No. 6 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: Topsoil and hay bales staged adjacent to the MPA for use in repairing eroded areas on the MPA.

Photograph No. 7 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: View of well MW-18 on top of the MPA in the foreground and the Rival Manufacturing Plant in the background.

Photograph No. 8 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: View looking north of the MPA showing the active bituminous concrete plant in the background.

Photograph No. 9 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: View looking south of the MPA. The slough/canal is located along the right side Lake Marie in upper left corner. Lake Marie has since been backfilled with soil.

Photograph No. 10 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: An approximate 50 ft. X 30 ft. section on the northeast corner of the solidified waste pile in the MPA which has no vegetation and eroded cover soil.



Photograph No. 11 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: Close-up view of the eroded area shown on Photograph No. 10. Note that the cover soil was completely eroded exposing the solidified waste.

Photograph No. 12 **Date:** November 19, 1997
Location: Flowood NPL Site Five-Year Review, Flowood, Mississippi
Description: Another bare soil area on top of the MPA measuring approximately 20 feet in diameter.